

SURVEYS OF ISS RETURNED HARDWARE FOR MMOD IMPACTS

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Since February 2001, the Hypervelocity Impact Technology (HVIT) group at the Johnson Space Center in Houston has performed 26 post-flight inspections on space exposed hardware that have been returned from the International Space Station. Data on 1,024 observations of MMOD damage have been collected from these inspections. Survey documentation typically includes impact feature location and size measurements as well as microscopic photography (25-200x). Sampling of impacts sites for projectile residue was performed for the largest features. Results of Scanning Electron Microscopy (SEM) analysis to discern impactor source is included in the database. This paper will summarize the post-flight MMOD inspections, and focus on two inspections in particular: (1) Pressurized Mating Adapter-2 (PMA-2) cover returned in 2015 after 1.6 years exposure with 26 observed damages, and (2) Airlock shield panels returned in 2010 after 8.7 years exposure with 58 MMOD damages. Feature sizes from the observed data are compared to predictions using the Bumper risk assessment code.